

APPLICATION NO. 10/799,126  
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### REMARKS

This is a full and timely response to the final Office Action mailed December 1, 2005. Upon entry of the foregoing amendments, claims 4-6, 10, 11, and 13-17 are pending in the application. Claims 7 and 8 have been canceled. Claims 4-6 and 10 have been amended. Claims 13-17 have been added. The subject matter of amended claims 4-6 and 10 can be found in the originally filed specification in at least FIGs. 1 and 3 and the related detailed description. The subject matter of new claims 13-17 can be found in the paragraph that bridges pages 3 and 4 of Applicants' specification. Consequently, no new matter is added to the present application. In light of the foregoing amendments and following remarks, Applicants request reconsideration of the application and pending claims.

#### I. Drawing Objections Under 37 C.F.R. 1.83(a)

##### A. Statement of the Objection

The drawings stand objected to under 37 CFR 1.83(a) as allegedly failing to show every feature of the invention specified in the claims. Specifically, the objection addresses claims 7 and 8.

##### B. Discussion of the Rejection

Applicants have canceled claims 7 and 8. Thus, the objection to the drawings is rendered moot.

#### II. Claim Rejections Under 35 USC § 103 – Claims 4-8, 10 and 11

##### A. Statement of the Rejection

Claims 4-8, 10 and 11 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent 5,016,046 to Nishiyama, hereafter *Nishiyama*.

##### B. Discussion of the Rejection

Applicants' claims 7 and 8 have been canceled. Accordingly, the rejection of claims 7 and 8 is rendered moot.

In order for a claim to be properly rejected under 35 U.S.C. § 103, the combined teachings of the prior art references must suggest all features of the claimed invention to one of ordinary skill in the art. See, e.g., *In Re Dow Chemical*, 5

U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), and *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981). To establish a *prima facie* case of obviousness, the prior art (or references when combined) must teach or suggest all claim features. Applicants' independent claims 4 and 10, as amended, comprise respective features that are not disclosed, taught, or suggested by the prior art.

Applicants' independent claim 4, as amended, is directed to an integrated circuit that comprises "a comparator directly coupled to the output of the transimpedance amplifier, the comparator comparing the sawtooth wave with the voltage output of the transimpedance amplifier to produce a pulse-width modulated digital output."

In contrast with Applicants' claimed integrated circuit, *Nishiyama* (FIG. 3) applies an inverting amplifier circuit and a high-level limiter circuit in series between amplifier IC1 and a PWM circuit. Thus, *Nishiyama* fails to show a comparator directly coupled to the output of the transimpedance amplifier. Consequently, *Nishiyama* fails to render Applicants' claimed integrated circuit obvious and the rejection of claim 4 under 35 U.S.C. § 103(a) should be withdrawn.

For at least the reason that claims 5 and 6 depend directly from claim 4 and include all the features of independent claim 4, the rejection of claims 5 and 6 under 35 U.S.C. § 103(a) should be withdrawn. *In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596, 1598 (Fed. Cir. 1998).

Applicants' independent claim 10, as amended, is directed to a method that comprises "comparing the sawtooth wave to the voltage without inverting the voltage representing the select range of wavelengths of visible light to produce a digital pulse-width modulated output, wherein the steps of converting the current, generating and comparing are accomplished in a single integrated circuit."

In direct contrast with Applicants' claimed method, *Nishiyama* (FIG. 3) applies an inverting amplifier circuit in series between amplifier IC1 and a PWM circuit. Thus, *Nishiyama* inverts the voltage that is applied to an input of the PWM circuit 7. For at least the reason that *Nishiyama* inverts the voltage input, *Nishiyama* fails to render Applicants' claimed method obvious.

In further contrast with Applicants' claimed method, *Nishiyama* (FIG. 1 and FIG. 3) indicates that AE sensor 3, amplifying circuit 4, inverting circuit 10 and PWM circuit 7 are separate entities. These separate entities require different supply voltages and circuitry that adds to the production and operating costs associated with *Nishiyama's* automatic exposure device. This is in direct contrast with the Applicants' stated motivation to reduce circuit space requirements and operating costs associated with analog processing between a photodiode and an output signal responsive to the intensity of light at the photodiode. For at least this separate reason, *Nishiyama* fails to render Applicants' claimed method obvious and the rejection of claim 10 under 35 U.S.C. § 103(a) should be withdrawn.

For at least the reason that claim 11 depends directly from claim 10 and includes all the features of independent claim 10, the rejection of claim 11 under 35 U.S.C. § 103(a) should also be withdrawn. *In re Fine, supra*.

### III. New Claims 13-17

New claims 13-17 are patentable over the cited art of record for at least the reason that *Nishiyama* fails to disclose, teach, or suggest an apparatus that includes "a single module comprising a ground pin, a single supply pin, and an output pin, the module further comprising: a photodiode configured to convert incident light to a current; a transimpedance amplifier configured to convert the current to a voltage; a sawtooth generator configured to produce a sawtooth wave; and a comparator configured to receive the sawtooth wave and the voltage to produce a pulse-width modulated digital output, wherein an output of the transimpedance amplifier is directly applied to an input of the comparator."

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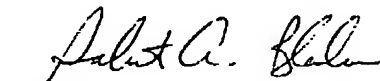
**CONCLUSION**

For at least the reasons set forth above, Applicants respectfully submit that pending claims 4-6, 10, 11, and 13-17 are allowable over the cited art of record and the present application is in condition for allowance. Accordingly, a Notice of Allowance is respectfully solicited. Should the Examiner have any comments regarding the Applicants' response, Applicants request that the Examiner telephone Applicants' undersigned attorney.

Respectfully submitted,

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